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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,723	02/21/2007	Julie Marie Wichert	70252/UST	2197

26748 7590 12/12/2008  
SYNGENTA CROP PROTECTION, INC.  
PATENT AND TRADEMARK DEPARTMENT  
410 SWING ROAD  
GREENSBORO, NC 27409

EXAMINER
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NWAONICHA, CHUKWUMA O

ART UNIT	PAPER NUMBER
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1621

MAIL DATE	DELIVERY MODE
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12/12/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/573,723	<b>Applicant(s)</b> WICHERT ET AL.	
	<b>Examiner</b> CHUKWUMA O. NWAONICHA	<b>Art Unit</b> 1621	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 July 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Current Status***

1. Claims 1-15 are pending in the application.
2. This action is responsive to Applicants' amendment of 7 July 2008.
3. Receipt and entry of Applicants' amendment is acknowledged.
4. The rejection of claims 1-10 under 35 U.S.C. 103 as being unpatentable over Javdani et al., {US 7,285,678, same as WO 2002076934} in view of Ueda et al., {US 4,937,386} for the reasons set forth in the previous Office Action dated 04/15/2008 is withdrawn in favor of this rejection.
5. The obviousness-type double patenting rejection of claims 1-5 as being unpatentable over claims 1-8 of copending Application No. 10/598,993 in view of Benke et al. is maintained for the reason given in the previous Office Action dated 04/15/2008. Applicants' claims still read on claims 1-8 of copending Application No. 10/598,993 in view of Benke et al.
6. The allowability of claims 14 and 15 is withdrawn in favor of this rejection.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claim** 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al., {US 4,937,386}, Javdani et al., {US 7,285,678, same as WO 2002076934}, Jacobson, {US 5591890} and Jones et al., {US 6,218,579}.

Applicants' claim a process for the preparation of mesotrione and reduction of the levels of undesirable impurities in a mesotrione sample; wherein all the variables are as defined in the claims.

**Determination of the scope and content of the prior art (M.P.E.P. §2141.01)**

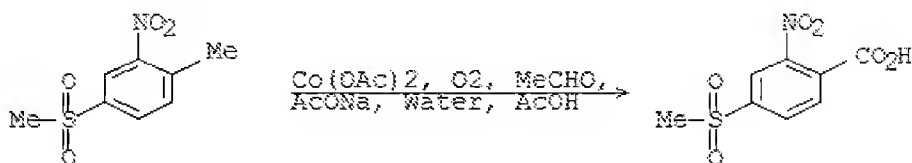
Ueda et al. teach a process for the preparation of 4,4,5-trimethyl-2-(2-nitro-4-methylsulfonylbenzoyl) cyclohexane-1,3-dione which is useful as herbicide and reduction of the levels of undesirable impurities in the compound. Ueda et al. also teach the formation of enol or enol ester. See column 2, structures II, II' and II'', the structures of column 3 and Example 1, lines 44-51.

Javdani et al. teach a process for the preparation of acid chloride from NMSBA. The acid chloride can then be reacted 1,3-cyclohexanedione in the presence of a cyanide catalyst and triethylamine to form crude mesotrione. The solvents were removed via distillation and the mesotrione precipitated from the remaining reaction

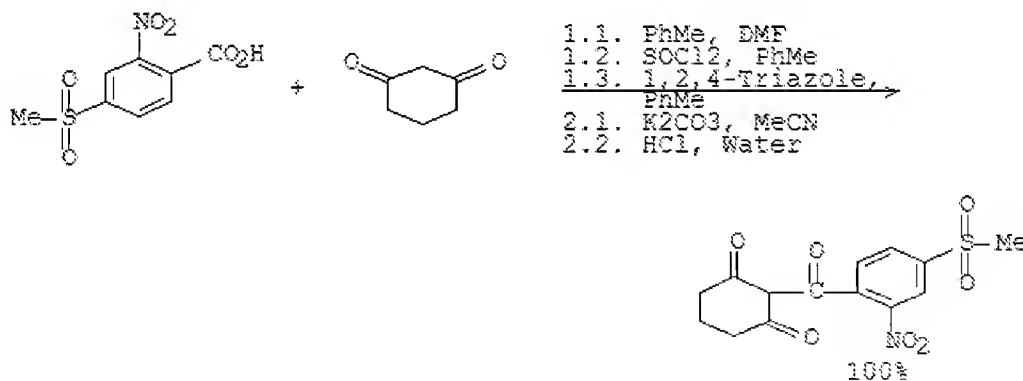
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mixture through a series of pH adjustment steps and isolated by filtration or centrifugation. See column 1, lines 14-64.

Jacobson teaches a process for the preparation of ortho-nitrobenzoic acids by the direct oxidation of ortho-nitroalkylaromatic compounds using molecular oxygen and a metal catalyst as shown below. See column 6, Example 7.



Jones et al. teach a process for the preparation of mesotrione from NMSBA and cyclohexane-1,3-dione through a series of steps to give the desired mesotrione product in 100% yield, as shown below.



**Ascertainment of the difference between the prior art and the claims (M.P.E.P..**

**§2141.02)**

The instant claims differ from the prior art reference of Ueda et al. in that Ueda et al. teach a process for the purification of 4,4,5-trimethyl-2-(2-nitro-4-methylsulfonylbenzoyl) cyclohexane-1,3-dione, which is a homolog of mesotrione. That is, hydrogen versus methyl group.

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On the other hand, the instant claims differ from the prior art reference of Javdani et al. in that Javdani et al. teach a process that employed cyanide catalyst and triethylamine while applicants are silent about their reaction medium or the catalyst employ.

The instant claims differ from the prior art reference of Jacobson in that Jacobson teaches the use of molecular oxygen and a metal catalyst for the oxidation process while applicants are silent about their reaction medium or the catalyst employ.

The instant claims differ from the prior art reference of Jones et al. in that Jones et al. teach a process for making mesotrione from NMSBA and cyclohexane-1,3-dione in 100% yield while applicants are silent about the yield of their process.

**Finding of prima facie obviousness--rational and motivation (M.P.E.P. §2142-2143)**

The instant claimed process for the preparation of mesotrione and reduction of the levels of undesirable impurities in a mesotrione sample, and the process of making mesotrione from ortho-nitroalkylaromatic compounds are obvious in view of prior art references of Ueda et al., Javdani et al., Jacobson and Jones et al.

One of ordinary skill in the art would have a reasonable expectation of success in practicing the instant invention by varying the process conditions as taught by Ueda et al., Javdani et al., Jacobson and Jones et al. to arrive at the instantly claimed process for the preparation of mesotrione and reduction of the levels of undesirable impurities in a mesotrione sample, and the process of making mesotrione from ortho-

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nitroalkylaromatic compounds. Said person would have been motivated to practice the teaching of the references cited because mesotrione is useful as herbicide. The Examiner notes that the formation of enolate is an intermediate product of the reaction of cyclohexanedione with 2-nitro-4-methylsulphonyl benzoyl chloride (NMSBC) and not a patentable distinction. The formation of enol or tautomer in solution is an inherent property of 1,3-dione compounds. See US 4,937,386 column 2, structures II, II' and II'', the structures of column 3. It should be noted that the purification process claimed by Applicants is a well known technique in organic chemistry as a means of eliminating impurities from organic samples and do not constitute a patentable distinction.

Moreover, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

**No claim is allowed.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chukwuma O. Nwaonicha whose telephone number is 571-272-2908. The examiner can normally be reached on Monday thru Friday, 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Chukwuma O. Nwaonicha/  
Examiner, Art Unit 1621

/Jafar Parsa/  
Primary Examiner, Art Unit 1621